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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/864,348	05/23/2001	Gregory W. Haggquist	TT-1	4568

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EXAMINER
PARKER, FREDERICK JOHN

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 02/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/864,348	HAGGQUIST ET AL.
	Examiner	Art Unit
	Frederick J. Parker	1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-37,39-44,47 and 48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-37,39-44,47 and 48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

The cancellation of non-elected claims 1-19,45-46 is acknowledged.

Specification

The amendments in response to the objections of the Previous Office Action are acknowledged and appreciated, and the Examiner withdraws the objections because of amendments.

Claim Objections

The amendments in response to the objections of the Previous Office Action are acknowledged and appreciated, and the Examiner withdraws the objections because of amendments.

Drawings

The drawing corrections of 12/03/03 are approved.

Claim Rejections - 35 USC § 112

The amendments in response to the 35 USC 112 rejections of the Previous Office Action are acknowledged and appreciated, and the Examiner withdraws the rejections based on the explanation of pages 14-15 of Applicants' response.

Claim Rejections - 35 USC § 103

The rejections under this heading of the previous Office Action are withdrawn in view of explanation on pages 18-20 of Applicants' response. They are replaced by the new rejections below based upon the discovery of additional prior art.

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 20-21,23-32,35-37,42-44,47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goller et al US 4175055 in view of Hillrichs et al US 5766443.

Goller teaches making electrochemical cell electrodes in which a porous carbon substrate 12 is placed over a vacuum box, below which turbine 20 creates a suction/ pressure gradient through the substrate to draw powder particles in a gas flow into chamber 16 to the substrate surface where they are deposited thereon or passed through (col. 5, 7-33). The powder comprises a mixture of carbon (as acetylene black, graphite, carbon black, etc per claim 28) which may also contain active catalyst particles disposed thereon, and polymer (PTFE) particles which bind carbon and polymer (hence a "chemical binder" per claim 37) to one-another and the substrate (col. 3, 24-28). Col. 5, 21-26 recognizes powder is deposited as a surface coating but also passes through porosity which means at least some particles are incorporated in the thickness of the substrate. The particle mixture is then sintered to cause bonding without limitation as to means and thereby encompassing coventional means in the art such as infra-red heating of claim 36. While weave of substrate is not limited, a woven substrate is not explicitly cited.

Hillrichs also teaches preparing electrochemical cells utilizing a gas permeable electrode comprising a "porous carbon woven fabric" coated with a mixture of PTFE polymer and carbon black activated with Platinum catalyst (same as Goller et al).

Goller teaches the use of porous carbon substrates for coated electrodes in electrochemical cells which are similar to those of Hillrichs which teaches the use of a woven carbon substrate which MUST be gas permeable because it is a gas diffusion electrode. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Goller et al by incorporating a porous carbon woven fabric as the substrate as taught by Hillrichs

et al because of the expectation of applying/ incorporating the carbon-polymer powder mixture by the process of Goller et al since the porous woven substrate is gas permeable.

Applicants claims state "to incorporate at least some of the...particulate...into the woven material". The combination of references would have necessarily surface coated and at least to some extent incorporated particles into a depth of the thickness of the woven substrate. Further, the references read on the independent claim even if the coating was predominant because (1) a coating is not excluded, and (2) even a coating would penetrate into surface porosity to some extent to met the limitation of incorporation of particles into the woven material. Thus the references read on the limitations of the independent claim as written.

The weights of woven material are not cited nor limited, except they are porous. Since weight and porosity would be inversely proportional, it is the Examiner's position that the skilled artisan would have selected and optimized a weight/ porosity of the substrate suitable for a given application by routine experimentation to achieve a desired powder loading, catalyst content, etc, per claims 23-24. Similarly, the amount of particulate applied would have been a matter of routine experimentation to achieve a desired degree of bonding and catalytic activity, per claims 30,47,48.

As to claims 42-43, the woven material would have been on a "relaxed state" as is evident from the holding means described by Goller. Maintaining the desired relaxed state using known and conventional holding means such as "picking fingers" would have been obvious, absent a clear showing to the contrary, per claim 44.

Given that Goller et al is not limited to type of carbon used (col. 3, 44-45), the use of other high surface area carbons, such as activated caqrbon, would have been obvious to provide

sufficient surface area onto which active catalyst is impregnated to maximize catalytic activity, per claim 29. The recitation also includes porous/ high surface area carbons which are inherently odor or moisture absorbent, as well as inherently capable of blocking ultraviolet radiation per claims 25-27.

3. Claims 22,33,34,39,41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goller et al US 4175055 in view of Hillrichs et al US 5766443 and further in view of Singh GB 2238802.

Goller et al and Hillrichs et al are cited for the same reasons previously discussed, which are incorporated herein. Slats and butterfly valves to control pressure drop across the substrate are not cited.

Singh teaches a method of producing a particulate- bearing air permeable material comprising entraining particles in an air stream substantially absent of fiber per claim 34; contacting the stream with one face of a fibrous material while maintaining and controlling a pressure drop across the thickness of the material such that at least some particulate material is retained within the fibrous material; and then fixing the particles to the fibers using a binder (pages 8-9). Pressure drop may be controlled by applying suction means to the face opposite the contacted face (p.11, last paragraph) . Suction box 14 comprises wooden slats (claim 32), fan, butterfly valve (claim 41), and bag filter, the adjusting of which to control particle distribution within the fabric would have been an obvious process parameter within the purview of one of ordinary skill. Re-circulation of non-entrapped particles, per claim 33, is taught on page 15, 2-6 which would have been an obvious economic benefit to reduce the amount of waste material generated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Goller et al in view of Hillrichs et al by incorporating the teachings of Singh to provide greater control of air flow across the substrate, thereby controlling the distribution of particles across the fabric.

Conclusion

Applicants claims are unpatentable in view of the rejections above. Specifically the independent claim 20 is obvious over Goller et al in view of Hillrichs because Goller sets forth the same process steps of claim 20 for a generic group of gas porous carbon substrates for electrochemical cells which Hillrichs defines as including porous woven carbon substrates. Since the woven substrate MUST be gas permeable, the process of Goller would have been expected to incorporate particles into the woven carbon substrate of Hillrichs.

4. Response to Applicants remarks and arguments regarding the rejections of the previous Office Action is moot in view of the new rejections above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 571/272-1415. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703/308-0661.

Frederick J. Parker
Primary Examiner
Art Unit 1762

fjp